

The Ramtop

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Telephone Line Problems
The Dayton Computer Fest
A Look at the future of CD ROMS

Line noise, The Phone Company, and Your Modem or FAX Modem

In reading the following information on your subscriber line, you must remember that you can only address the type of phone service you pay for and the longdistance carrier your call is routed through. You normally have NO control over conditions that may be present in local office switches or calls placed in your "LOCAL LONG DISTANCE" area. This means that regardless of how much the phone company may do to your line, there will still be places you can't get a good connection to. Also, if the whole problem turns out to be the local switching equipment, you are just plain out of luck (unless you can get the local phone company to replace equipment that runs between tens of thousands to hundreds of thousands of dollars).

POTS (Plain Old Telephone Service) is the type of phone service most people have.

This is what it you get:

- most 300hz to 3000hz sounds are passed.

- You aren't likely to get any more than -10db loss from the local telephone office to your phone jack. (Measured from a 1mW 1khz tone source.)

- VOICE use (you should be able to hear another person's voice using normal, FCC approved, telephone devices via this service). (No implied ability to use Modems, Faxes, or other "non-voice" devices over this service.)

The legal requirements for voice lines aren't even this good, but this is an average service.

DATA-GRADE / ASSURED QUALITY (PAC BELL)
/ or other "BETTER" service offered.

These types of service are offered as an "upgrade" from POTS (often at a much higher installation fee, and an additional monthly service fee).

The services supported and/or promised by such upgrades will vary widely from one telephone service provider to the next and are not supported at all in some cases. In general, they will provide a "cleaner" telephone connection that is able to support fax and data communication to a specific carrier rate, and normally have no more than a 5db loss. These services may also provide a specially installed line with no LOADS and no BRIDGE-TAPS. Ideally, these lines will be able to supply a 600 ohm balanced line, and should respond very well when devices (like FCC approved Telephones, Modems, Faxes, etc.) are connected.

Items and Conditions that commonly degrade telephone lines:

BRIDGE-TAPS & HALF-TAPS

These are "extra" wires connected to the wire pair coming to your home from the local telephone office. Often these are the result of normal service and repair procedures that occur over the years. These don't normally create a problem for VOICE use (although they have been traced to things like radio stations or buzztype noises in some cases). Devices using complex signaling tones and patterns, however, can be greatly affected by these "extra" signals on the phone line. These extra wires act like antennas and pick up noises from a wide range of sources.

LOADS (Step-Up Transformers)

These are commonly used to increase the volume of voices on longer phone lines. They cause distortion of the rated 300hz to 3000hz band pass, and can cause the frequencies to be shifted up or down from their original values. The volume of these frequencies is also not increased equally. In some cases, the line can become poor enough that TOUCH-TONE dialing may not be supported, and only PULSE dialing is possible. LOADS are most commonly used in older, rural settings, but still do exist in urban installations. LOADS also serve a means of introducing high levels of noise onto the line, both by increasing the level of noise on the line along with the voice level and by picking up environmental noise from the area directly around the transformer itself (other transformers, power supplies, high voltage power lines, etc.).

Line Loss

This is the composite of all of the types of loss on your phone line which include the following:

-Pure Loss

This natural loss in the phone line caused by the resistance of the wire and connections between the local office and your home.

-Return Loss

This is a measurement of the signal loss on the line. This is affected by the line itself (see above) and the devices you have connected to it. It is basically a measurement of the impedance match between the local office and the line and the devices you have connected (problems in any part will affect the over-all measurement).

-Frequency Distortion and Attenuation.

This is basically the loss of volume and shift in frequency on the line. Problems often arise in high-speed data transfers because only part (or in very poor conditions none) of the original signal gets transferred faithfully to the receiving end. In some cases many frequencies have been "reflected" back on to each other further damaging the signal.

Common Tests to ask to have done by the phone company:

-Frequency Test (also called Frequency "Slope" or Frequency "Twist" test)

This test shows both total loss in signal, and the amount of difference in signal loss at different frequencies. A 1mW 1Khz signal is measured for total loss (in db) and then compared to readings taken from signals at 400hz and 2800Hz. For a VOICE line, the high and low frequency values should be within a +3db to -5db range of the value of the center frequency (a DATA grade line should be closer the reading of the center value). In conditions where this problem is quite bad, you will hear the voices as being "tinny" and it may be more difficult to recognize voices over those lines.

Loss and/or Return Loss Test

This will test the loss of a signal transmitted from one end of the line to the other. (In the case of a Return Loss Test, it tests the loss of a signal transmitted into the line and reflected back from the other end. -45db is a reasonable level, -60db is not acceptable.

Common Tests to do yourself / Common Problems from devices connected:

-Try the modem/fax with ALL other devices removed from the line. This tests for two common problems:

1. NOISE -from devices like cordless phone and "neon-display" phones most commonly, but also can be sourced by any telephone line device.

2. Signal Loss -from devices that "pull" power off the phone line. Phones and devices that take power from the line when not actively in use for dialing memory, status lights, and lighted displays (although most lighted displays are only taking power when the handset is picked up) will lower the power level on the line, and will also lower the signal levels being passed on the line.

-Check the condition of the phone wiring in your home.

Wires should be at least 26 gauge, 22 gauge is better. Insulation should be in good condition. Wiring runs should be kept out of direct sunlight and weathering. (If wiring must be done outside, use phone wire rated for

out-door use.) Remove wiring runs no longer in use (this does not mean to rip out any phone outlet you aren't using, but it IS a good idea to remove wiring that has already been disabled or covered up by remodeling -many older homes and rentals have phone lines that go nowhere!)

WARNING! If you find equipment that you don't understand connected to the phone lines in your home, or "extra" wiring to transformers or grounding rods/water lines, do not disturb it without talking to the phone company about it.

This document will be updated, so please check the Supra BBS {503-967-2444} to assure the most current information. This document is a combination of data from engineers at Supra, an engineer who works for AT&T, and my own knowledge and education relating to data communication and transmission lines.

Patrick Moore Supra Technical Support, SysOp Supra BBS

Notes: For Computer Users

This is our summer issue. We haven't had the contributions that we should have and we need more contributions from our members if we are to survive as a club. It looks unlikely that I will have the time after the end of the year to continue with the newsletter.

The big news is the Dayton Computer Show coming up August 27th and 28th. It is to be held at the Hara Arena in Dayton. the hours are 9 AM to 6 PM on Saturday and 10 to 4 PM on Sunday. The cost of admission is \$7.00. Further information can be obtained by calling 513-223-FEST. Frank Davis and Paul Holmgren will be there and they say there will be a picnic at Tim Swenson's house Saturday Night 7-11. They will distribute maps at their table the day of the show. I hope we can have a few members show the flag there for Cleveland.

While scanning the message base on CIS I found a note from Andrew Hradesky that noted that the QXL card works very well with Geoworks Pro v.2 and Ensemble 2.1. I've also heard that there is a new version of the Spectrum Emulator out so you may want to send your dollars to Gerton Lunter if you haven't done so yet.

On the PC front more and more software is becoming available in CD ROM format. One recent

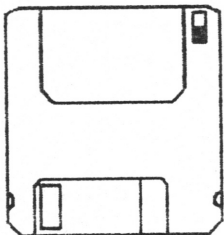
gem was 500 fonts on a CD ROM by Bitstream. Bitstream is a mainline font house for typographers as well as the desktop types. Games of course have long exploited the facility of the medium. One amazing game that I recently had the opportunity to check out was the Seventh Guest. I had hoped that some of our members would make a list of the CD ROMS they own and provide a thumbnail review. Of those I have seen only a few dogs stick in my ind and those are primarily shareware collections. The Only commercial dud that I can recall right now is Encarta, an encyclopedia which is strong on graphics and images and short on facts. It is interesting to recall that there were a number of compilations published on CD ROM to be loaded from an audio CD player into the Spectrum years ago. Of course the vision didn't quite match the performance but I believe that they may have been one of the first to use this medium. More and more it seems that CD ROMs will be the way that software will be published for two reasons: the first being that the CD prevents piracy, second that the production of CD ROMs in quantity is cheaper and of higher quality than the equivalent magnetic media.

I have been using Lotus Write on the PC and I find this to be an excellent program. It is version 2.0 of Ami Pro and has quite a few of the features in the current version. One exception is the ability to handle tables. It is available at Walmart and Sam's Club for \$35 and \$31 respectively. I have also heard good things about Word Star for Windows which is also not very

expensive. I had to abandon the Quill for the PC because I upgraded to Novell DOS 7. It seems to do the job but there are still a few bugs that have to be worked out, in my opinion. I have had quite a few problems with it in windows although it has settled down some and seem to have some problems with either my print drivers or graphics drivers for both the Quill and Finesse. Novell's support is a little on the thin side. I believe that they hired someone from Microsoft to help with their customer support. Additionally they offer only 30 days of support after you call in. Dave Hoshor called Borland recently and had one of those long spiels to press the button at the toneIt turns out that Novell is running Borland's support line. Microsoft continues to dominate the market just by sheer numbers of products, unfortunately they still have the worst documented programs in the business and I am including shareware documentation too.

I recently upgraded to a 14.4 Fax modem. It seemed logical as the prices have dropped drastically with the introduction of the 28.8 VFast modems. I would recommend the 14.4 for everyone using either a QL or PC. I don't believe that the Spectrum or 2068 could handle the speed.

This is the first issue of the Ramtop that is being produced entirely with Page Plus. Please excuse any mistakes that I have made getting used to this software. Until next time. Thomas Simon, Editor of the Ramtop



The Ramtop
4568 Williamston Ave.
Brooklyn, Ohio 44144